

Emergency Transboundary Outbreak Pest (ETOP) Situation Bulletin for August with a forecast through mid-October 2021
résumé en français est inclus

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**¹): In the central outbreak region (COR), control operations were carried out against residual populations of immature swarms on some 12,000 ha in northern Somalia. Access to northeast Ethiopia (Afar) to conduct surveillance and control operations remained restricted; however, egg laying, hatching and band formation are likely. In Djibouti, a few scattered adults were detected. In Sudan, small-scale breeding and scattered adults were reported and control operations treated 180 h. In Eritrea, a few scattered adults were reported in western region. A few isolated adults were observed in southern Egypt. Breeding continued in the interior and southern coast of Yemen where a few hopper bands were forming. Small-scale breeding was reported in Chad, but no locusts were reported elsewhere in the western outbreak region (WOR) or the eastern outbreak region (EOR) during this month.

Forecast: In COR, a few immature swarms likely to persist in northern Somalia. Hopper bands and swarms will likely form in northeast Ethiopia, and perhaps southern Djibouti and swarms will move north to Eritrea, eastern Ethiopia, and northern Somalia where they will mature and breed in October. In Sudan, the drying out of vegetation will form locusts to concentrate and form small groups. New swarms could form in the interior of Yemen and migrate to coastal areas for winter breeding. In WOR, small-scale breeding is likely in the northern Sahel of Mauritania, Mali, Niger, and Chad. In EOR, the chance for small-scale breeding along both sides of the India-Pakistan border will decline as the monsoon season retreats.

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (**NSE**): NSE swarms were reported in primary outbreak areas in Malawi, and significant populations are expected in primary outbreak areas in Mozambique, Tanzania, and Zambia.

African Migratory Locust: *Locusta migratoria migratorioides* (**LMI**): Isolated LMI populations (1-5 locust/m²) were reported in Simalaha Plains, Western Province of Zambia.

Malagasy locust (*Locust migratoria capito* – **LMI-C**): LMI-C activities are expected to have continued slowing down due to cold weather. FAO/ECLO prepared an action plan for the next campaign season at the request of GoM.

¹ Definitions of all acronyms can be found at the end of the report.

Tree Locusts, *Anacridium spp.* (ASP): No ASP activities reported during this month.

Central American Locust, *Schistocerca piceiferons* (SPI)(CAL): No update was received on CAL in Central America (CA) during this month; however, significant development is not expected during this time.

South American Locust, *Schistocerca cancellata* (SCA): No update was received, but SCA activities are expected to have continued Argentina and adjacent areas.

Italian (CIT), Moroccan (DMA), and Asian Migratory Locusts (LMI): DMA, CIT and LMI activities are expected to continue in some parts of Caucasus and Central Asia while decline in some areas (CCA).

Fall Armyworm (*Spodoptera frugiperda*, J. E. Smith) (FAW): FAW outbreaks were reported affecting irrigated maize in Malawi. No reports were received from other IRLCO-CSA member states, but the pest may be present in other several maize growing countries.

African Armyworm (AAW) (*Spodoptera exempta*): AAW outbreak was not reported during this month.

Quelea spp. (QSP): QSP outbreaks were reported attacking irrigated maize in several provinces in Zimbabwe and in the coastal region in Tanzania. Quelea outbreaks were not reported in other IRLCO-CSA member states.

Active surveillance, monitoring and timely preventive and curative control as well as timely sharing of information on ETPs remain critical to abate the threats ETOPs pose to food security and livelihoods of vulnerable communities.

USAID/BHA/TPQ regularly monitors ETOPs in close collaboration with its global network of PPDs/DPVs, regional and international pest monitoring and control entities, FAO, CLCPRO, CRC, DLCO-EA, and IRLCO-CSA, and research centers, academia, private sector, NGOs and others and issues monthly analytical ETOP Bulletins to stakeholders. **End summary**

RÉSUMÉ

La situation du Criquet pèlerin (*Schistoseca gregaria* - SGR): Dans la région centrale du foyer (COR), des opérations de lutte ont été menées contre des populations résiduelles d'essaims immatures sur quelque 12 000 ha dans le nord

de la Somalie. L'accès au nord-est de l'Éthiopie (Afar) pour mener des opérations de surveillance et de contrôle est resté restreint; cependant, la ponte, l'éclosion et la formation de bandes sont probables. A Djibouti, quelques ailés épars ont été détectés. Au Soudan, une reproduction à petite échelle et des ailés épars ont été signalés et les opérations de lutte ont traité 180 ha. En Érythrée, quelques ailés épars ont été signalés dans la région occidentale. Quelques ailés isolés ont été observés dans le sud de l'Égypte. La reproduction s'est poursuivie dans l'intérieur et la côte sud du Yémen où quelques bandes larvaires se formaient. Une reproduction à petite échelle a été signalée au Tchad, mais aucun criquet n'a été signalé ailleurs dans la région résidentielle occidentale (WOR) ou la région résidentielle orientale (EOR) au cours de ce mois.

Prévisions: Dans le COR, quelques essaims immatures vont probablement persister dans le nord de la Somalie. Des bandes larvaires et des essaims se formeront probablement dans le nord-est de l'Éthiopie, et peut-être le sud de Djibouti et des essaims se déplaceront vers le nord jusqu'en Érythrée, l'est de l'Éthiopie et le nord de la Somalie où ils arriveront à maturité et se reproduiront en octobre. Au Soudan, le dessèchement de la végétation formera des criquets qui se concentreront et formeront de petits groupes. De nouveaux essaims pourraient se former dans l'intérieur du Yémen et migrer vers les zones côtières pour la reproduction hivernale. Dans le WOR, une reproduction à petite échelle est probable dans le nord du Sahel de la Mauritanie, du Mali, du Niger et du Tchad. En EOR, la probabilité d'une reproduction à petite échelle le long des deux côtés de la frontière indo-pakistanaise diminuera avec le recul de la saison des moussons

Criquet nomade (*Nomadacris septemfasciata*) (NSE): des essaims de NSE ont été signalés dans les zones de résurgence primaire au Malawi, et des populations importantes sont attendues dans les zones de résurgence primaire au Mozambique, en Tanzanie et en Zambie.

Criquet migrateur africain: *Locusta migratoria migratorioides* (LMI): *Locusta migratoria migratorioides* (LMI): Des populations isolées de LMI (1-5 criquets/m²) ont été signalées dans les plaines de Simalaha, province occidentale de la Zambie.

Criquet migrateur capito, (LMIC): les activités de l'IMT-C devraient avoir continué à ralentir en raison du temps froid. La FAO/ECLC a préparé un plan d'action pour la prochaine campagne à la demande du GoM.

Le criquet arborial, *Anacridium spp*: (ASP): n'a pas été signalé au cours de ce mois.

Criquet Amérique centrale, *Schistocerca piceifrons piceiferons* (SPI/CAL): Aucune mise à jour n'a été reçue sur le CAL en Amérique centrale (CA) au cours

de ce mois, cependant, aucun développement significatif n'est attendu pendant cette période.

Criquet d'Amérique du Sud, *Schistocerca cancellata* (SCA/SAL): Aucune mise à jour n'a été reçue, mais les activités du SCA devraient se poursuivre en Argentine et dans les zones adjacentes.

Criquets italiens (CIT), marocains (DMA), Asian Migratory Locust (LMI): les activités du DMA, du CIT et du LMI devraient se poursuivre dans certaines parties du Caucase et de l'Asie centrale tout en diminuant dans certaines régions (CCA).

Chenille Légionnaire d'automne (*Spodoptera frugiperda*, J. E. Smith) (FAW): Légionnaire d'automne (FAW): Des foyers de la chenille légionnaire d'automne ont été signalés affectant le maïs irrigué au Malawi. Aucun rapport n'a été reçu d'autres États membres de l'IRLCO-CSA, mais le ravageur peut être présent dans plusieurs autres pays producteurs de maïs.

Chenille Légionnaire africaine (AAW): aucun foyer d'AAW n'a été signalé au cours de ce mois.

***Quelea spp. oiseaux* (QSP):** Des foyers de QSP ont été signalés attaquant le maïs irrigué dans plusieurs provinces du Zimbabwe et dans la région côtière de Tanzanie. Aucun foyer de quéléa n'a été signalé dans d'autres États membres de l'IRLCO-CSA.

La surveillance active, le suivi et les interventions préventives et curatives opportunes ainsi que le partage des information ETOP restent essentiels pour réduire les menaces que les ETOP font peser sur la sécurité alimentaire et les moyens de subsistance des communautés vulnérables.

USAID / BHA / PSPM surveille régulièrement les ETOP en étroite collaboration avec son réseau de PPD / DPV nationaux, d'entités régionales et internationales de surveillance et / ou de lutte antiparasitaire, y compris la FAO/ECLO, la CLCPRO, le CRC, le DLCO-EA et l'IRLCO-CSA, et des centres de recherche, universités, secteur privé, ONG et autres et publie des Bulletins analytiques concis à l'intention des parties prenantes. Fin de résumé

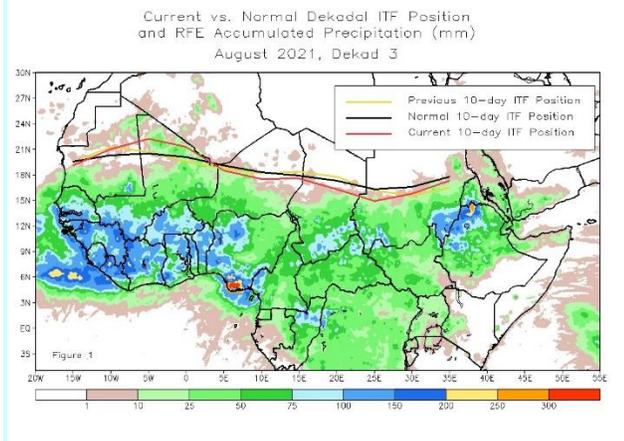
Note: All ETOP Bulletins, including previous issues can be accessed and downloaded on USAID Pest and Pesticide Monitoring website:

[USAID Pest and Pesticide Monitoring](#)

Additional resources on ETOPs can be found on the last pages of this Bulletin.

Weather and Ecological Conditions

From 21-31 August, the Inter Tropical Front (ITF) moved farther north along its western edge, whereas it continued its withdrawal southward along its eastern counterpart. The mean western (10W-10E) portion of the ITF was approximated at 20.1N, compared with last year's position at 20.0N. The long-term average position was, however, located at 19.7N. The mean eastern (20E-35E) portion of the ITF was averaged at 16.1N, compared with the past year's position at 19.1N.



Meanwhile, the climatological position was centered over 17.0N. Figure 1 (above) displays the current position of the ITF relative to the long-term average position during the 3rd dekad of August and its previous position during the 2nd dekad of August. Figures 2 and 3 are time series, illustrating the latitudinal values of the western and eastern portions of the ITF, respectively, and their seasonal evolutions since the beginning of April 2021 (NOAA 8/21).

Figure 2.

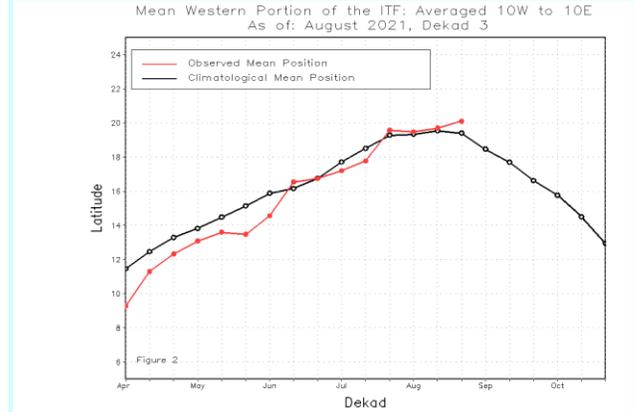
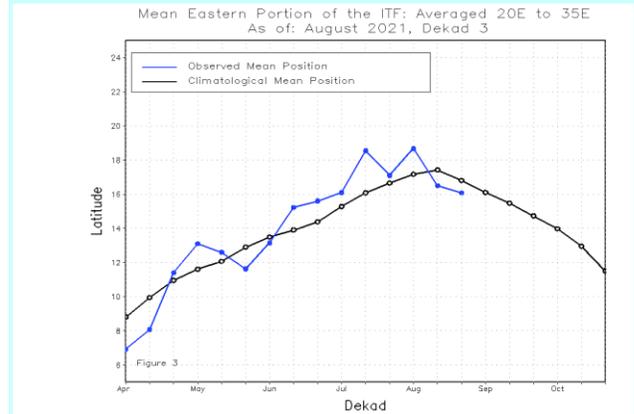


Figure 3.



During the 2nd week of August, the heaviest rainfall totaling more than 150 mm was observed in western Guinea, central Sierra Leone, southern Nigeria, and eastern Chad. The pattern resulted in large positive rainfall anomalies of over 100 mm in those areas. During the 1st week of August, rainfall was above-average over southwestern Sudan, northwestern South Sudan, local areas in Eritrea, and northwestern Ethiopia. Precipitation was slightly below-average over southeastern Sudan, eastern South Sudan, Uganda, western Kenya, and parts of Ethiopia; weekly rainfall total exceeded 150 mm in western Sudan, and northern Eritrea (with moisture surpluses of over 100 mm). Vegetation was green and greening in summer breeding areas

in western lowlands in Eritrea and in Sudan (NOAA).

The **NSE** region, remained generally hot and dry during this month. Vegetation burning was in progress in most of the outbreak (IRLCO-CSA).

CCA Region: Significant weather anomalies were not observed in CCA region; normal summer weather with warmer temperatures and precipitation, suitable for locust development prevailed.

ETOP proliferation vis-a-vis climate factors

Note: Changes in the weather pattern such as increased or decreased temperatures and precipitation can contribute to an ecological shift in ETOP habitats and could increase or decrease the risk of pest outbreaks, resurgence and/or emergence of new pests. The extended ETOP appearance, prevalence, outbreaks, and upsurges are partially attributed to the change in the weather pattern, i.e., extensive, and above normal rainfall partly associated with the occurrence of multiple cyclones or drought significantly impact pest proliferation causing additional stress on vulnerable communities and populations e.g., multiple cyclones in the western Indian Ocean in the Arabian Peninsula and the Horn of Africa region that occurred in less than two years from May 2018 to December 2019 lead to major SGR upsurges and outbreaks that continued impacting the ECA region that continued through 2021 in COR region. http://www.cpc.ncep.noaa.gov/products/international/casia/casia_hazard.pdf
End note.

Detailed Accounts of ETOP Situation and a Forecast for the Next Six Weeks are provided below

The **Desert Locust** (*Schistoseca gregaria* - **SGR**²): In the central outbreak region (COR), control operations were carried out against residual populations of immature swarms on 11,985 ha in northern Somalia. In Ethiopia, lack of access to northeast part of the country (Afar and Amhara regions) prevented surveillance and control operations, and most likely allowed unabated egg laying, hatching and band formation and potentially formation of adults. If left unattended, this could lead to increased breeding, preventing efforts to break the outbreak and invasion cycles in Horn and East Africa. In Djibouti, only a few immature adults were detected, but no significant activities were reported during this month and ecological conditions are drying up.

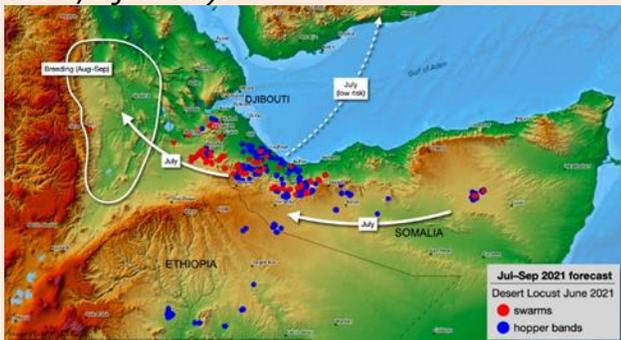
In Eritrea, during 1-16 August, mature low-density adults were detected in some areas in the western lowlands near Teseney, but control operations were not required. In Sudan, survey operations continued in North Kordofan from Al Obeid to Gabret Elshikh and east Khartoum states and elsewhere. Scattered mature adults were detected; control operations treated 180 ha during this month. A few isolated adults were observed in southern Egypt. Breeding continued in the interior and southern coast of Yemen where a few hopper bands were forming.

Survey operations covered several areas Oman, but the situation remained calm, and no locusts were reported during this month (DLMCC/Yemen, FAO-DLIS,

² Definitions of all acronyms can be found at the end of the report.

LCC/Oman, PPD/Ethiopia, PPD/Sudan, SPPV/Djibouti).

Forecast: In COR, hopper bands and swarms will likely form in northeast Ethiopia (Afar and Amhara), and perhaps southern Djibouti. Swarms from northeast Ethiopia and Djibouti will likely move further north to Eritrea, east to Somali region of Ethiopia and northern Somalia where they will likely mature and begin breed by October. A few immature swarms will likely persist in northern Somalia. In Eritrea, locust numbers are expected to increase due to favorable ecological conditions and likely swarm migrations from Ethiopia and Djibouti during the forecast period. In Sudan, vegetation drying will force locusts to concentrate and form small groups. In Yemen, new swarms could form in the interior and migrate to coastal areas for winter breeding. Oman and neighboring countries will remain calm during the forecast period (BHA/TPQ, DLMCC/Yemen, FAO-DLIS, LLC/Oman, PPD/Eritrea, PPD/Ethiopia, PPD/Sudan, SPPV/Djibouti).



Locust forecast map from July-September (FAO-DLIS).

SGR – WOR: In Chad, scattered low density mature, immature, and maturing solitarious adults as well as a few solitarious 3rd and 4th instar hoppers were observed around Kalait, but the situation remained generally calm elsewhere in the country.

Although ecological conditions were favorable in the primary outbreak areas in Mali, Morocco (in the Draa, Ziz and Ghri valleys), Mauritania, and Niger, locusts were not reported in these countries or elsewhere in the region during this month (ANLP/Chad, CNLCP/Mali, CNLAA/Mauritania, CNLAA/Morocco, FAO-DLIS, LLD/Libya).

Forecast: In WOR, small-scale breeding is likely in northern Mauritania, Mali, Niger, and Chad, but significant developments are not expected during the forecast period (ANLP/Chad, CNLCP/Mali, CNLAA/Mauritania, CNLAA/Morocco, FAO-DLIS, LLD/Libya).

SGR - EOR: The region remained calm, and no locusts were reported in Afghanistan, India, Iran, or Pakistan during this month (FAO-DLIS).

Forecast: Small-scale breeding may occur in parts of Rajasthan and Gujarat in India and in parts of Cholistan, Nara and Tharparkar in Pakistan. However, significant developments are not likely in the EOR during the forecast period (FAO-DLIS).

NOTE: Potential use of innovative technologies, such as drones, for high-resolution images in remote sensing is being explored. On trial bases, use of drones for locust monitoring, and control in localized and sensitive, hard to reach areas showed promising results. While range of agricultural drones may be limited, there are interests among countries and partners to work on several parameters associated with such technologies, including air space access protocols and other issues. Crowd and cloud sourcing for data collection, sharing, etc. is another effort that can be of value to ETOP operations. Dynamic population modeling and biotope

modeling, from CIRAD and ICIPE, respectively, and accounting for associated parameters such as soil moisture, vegetation, etc. will likely contribute to better understand ETOP – DL phenology, ecology, habitat range, etc. **End note.**

Red (Nomadic) Locust (NSE): NSE swarms persisted in Lake Chilwa/Lake Chiuta plains in Malawi where community locust scouts and monitors reported the presence of locusts. Significant populations were expected in other primary outbreak areas in Mpatsanjoka Dambo in Malawi; Ikuu-Katavi, Malagarasi, Rukwa plains and Bahi Valley in Tanzania; Kafue Flats in Zambia; and Buzi-Gorongosa and Dimba plains in Mozambique (IRLCO-CSA).

Forecast: Vegetation burning in Lake Chilwa/Lake Chiuta plains in Malawi, Buzi-Gorongosa and Dimba plains in Mozambique, Kafue Flats in Zambia and Ikuu-Katavi plains, Malagarasi Basin, Lake Rukwa and Bahi Valleys in Tanzania will continue to force locusts to further concentrate and form denser swarms which, if left unabated, will escape, and invade neighboring areas and threaten crops and pasture. There is an urgent need to carry out survey before the start of rains when breeding commences (BHA/TPQ, IRLCO-CSA).

African Migratory Locust (LMI): Isolated low density (1-5 locust/m²) LMI populations were reported in Simalaha Plains in Western Province of Zambia. No reports were received elsewhere in the region or in other outbreak areas, during this time, however, a similar situation is likely in primary breeding areas in neighboring countries in southern Africa

region and elsewhere (BHA/TPQ, IRLCO-CSA).

Malagasy locust (*Locust migratoria capito* – LMIC): Drought and the cold winter season are expected to have slowed down locust developments and movements in previously invaded areas in the southern region. COVID-19 related travel restrictions affected timely staff and material distributions to affected areas. In anticipation of the next breeding cycle that will follow the beginning of the seasonal rains from October 2021 and at the request of the MoA/Madagascar, FAO-ECLO prepared a joint action plan for the next campaign. The action plan focuses on four key components - 1. Improve monitoring capacity and analysis of the locust situation; 2. Strengthen locust control capacity. 3. Protect human health safety and protect the environment; 4. coordinate and assess the action plan (FAO-ECLO).

Active surveillance, monitoring, preparedness and timely preventive and curative interventions are critical to avert significant locust developments and the potential threat they pose to food security and livelihoods of vulnerable communities (BHA/TPQ).

Central American Locust - *Schistocerca piceifrons* (SPI/CAL): SPI (CAL): No update was received at the time this bulletin was compiled, but CAL is expected to have been present in Central America (CA) where mating and egg laying is expected to have begun during the month [note: Back in May, patches of early nymph - see picture below - were detected in CA and begun developing following the seasonal rain...]

Forecast: CAL is expected to have continue further developing in August and likely to form 2nd generation during the forecast period from October requiring increased intervention (Pech).

[**Note:** CAL is a pest of economic importance in Mexico and CA where it attacks hundreds of species of plants of economic importance, including agave, banana, beans, corn, cotton, peanut, rice, sesame, soybean, sorghum, sugarcane, several fruit trees].



SENESA, Petch – SENESA, Mexico)

South American Locust, *Schistocerca cancellata* (SCA) (a.k.a. Flying lobster):

With favorable ecological conditions in place, the locust is expected to have continued developing in Argentina. Surveillance and control operations are expected to have continued in the outbreak and invasion regions and countries (BHA/TPQ).

<https://www.voanews.com/americas/argentina-battles-locust-plague-northern-province>.

In **Mexico**, patches of the Giant Grasshopper, *Tropidacris cristata* were observed in coffee crops during previous month (Pech).

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Caucasus

and Central Asia (CCA): No update was received for August at the time this bulletin was compiled, but DMA and CIT activities are expected to have declined while LMI continued in some countries especially in Azerbaijan, Kazakhstan, Russian Federation and Uzbekistan during this month.

Forecast: Overall the locust situation will continue decline in some countries in the regions during the forecast period (BHA/TPQ) <http://www.fao.org/locusts-cca/en/>

Fall armyworm (FAW): FAW outbreaks were reported infesting 37,000 ha of irrigating maize in shores of Lake Malawi and Shire Valley in Malawi where control operations were carried out by the affected farmers with technical and material assistance from the Ministry of Agriculture. No FAW outbreaks were reported in other IRLCO-CSA member states, namely, Kenya, Mozambique, Tanzania, Zambia or Zimbabwe and Kenya, but low populations of the pest may have persisted in irrigated cereal crops (IRLCO-CSA). FAW presence in other countries in Africa, Asia and/or elsewhere where maize crops are in season or are under irrigation is likely (BHA/TPQ, IRLCO-CSA).

Forecast: FAW is likely to continue affecting rain-fed and/or irrigated maize and other cereal crops across sub-Saharan Africa, Asia, the Pacific Regions and elsewhere during the forecast period. *Active monitoring, surveillance, reporting, and timely interventions remain critical to abate any major crop damage* (BHA/TPQ).

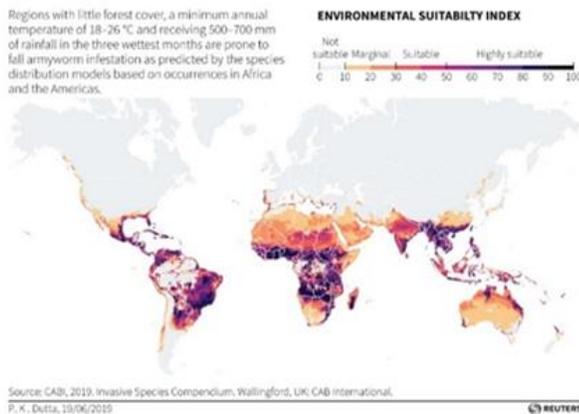
NOTE: The Food and Agriculture Organization of the United Nations (FAO) proposed a transformative, coordinated

Global Action for Fall Armyworm Control (GAFC). With an estimated total budget of USD 500 million (USD 450 million for the Global Action and USD 50 million for Global Coordination), GAFC is planned to be implemented in 65 [target] countries across Africa, Near East and Asia-Pacific from 2020 to 2022.

The GAFC is a pioneering initiative that aims to take radical, direct, and coordinated measures to fight FAW at a global level with the 3 key objectives to:

1. Establish a global coordination and regional collaboration on monitoring, early warning, and intelligent pest management of FAW:
2. Reduce crop losses caused by FAW and
3. Reduce the risk of further spread of FAW to new areas (Europe and South Pacific).

Areas suitable to Fall Armyworm



BHA/TPQ is working with various partners on innovative intervention projects to benefit small-scale farming communities in affected countries with the intention to scale-up gains across different FAW prone regions and consistent with the spirit of GAFC. These initiatives build on experiences gained over the past several years, including outcomes of projects and

programs supported through legacy OFDA, legacy BFS, CGIARs, FAO, national partners, and several other entities.



(Source: Prasanna, 2021)

Note: Several species of natural enemies of FAW have been identified in Ethiopia, Kenya, Tanzania, Madagascar, India and elsewhere and are under rigorous investigations to determine their efficacy, effectiveness, environmental impacts, safety, and other relevant parameters before they are released for extensive use. **End note.**

African Armyworm (AAW): AAW was not reported in its primary outbreak areas or invasion areas during this month (BHA/TPQ, IRLCO-CSA).

Forecast: Significant AAW appearance is not likely during the forecast period (BHA/TPQ, IRLCO-CSA).

Note: Legacy OFDA developed printable and web-based interactive maps for AAW: <http://usaid.maps.arcgis.com/apps/View/index.html?appid=8ff7a2eefbee4783bfb36c3e784e29cb> BHA/TPQ is considering a similar map for the CBFAMFEW countries.

Quelea species (QSP): QSP outbreaks were reported damaging rice crop in Chalinze District, Coastal Region in Tanzania. The outbreaks were controlled by Plant Health Services, Ministry of

remain vigilant and report ETOP detections to relevant authorities in their jurisdiction as quickly and as often as possible.

Strong surveillance, monitoring and quarantine enforcement remain critical to prevent invasive pest species.

BHA's Contributions to ETOP Abatement Interventions

USAID/BHA/TPQ is supporting operational research through a DRR with Arizona State University to develop a tool to manage the Senegalese grasshopper (OSE).

OSE is a notorious pest of cereal and vegetable crops and pasture and causes serious damage to small-holder farmers across wide geographic coverage extending from the Canneries to Cape Verde to nearly all sub-Saharan Africa regions to India and beyond. This pest occurs more frequently than several other grasshopper/locust species and is a constant threat to farmers and pastoralists.

USAID/BHA/TPQ will continue its support through a DRR project to strengthen national and regional capacity of the Caucasus and Central Asia (CCA) countries that are constantly affected by three major locust species – Moroccan locust, Italia locust and the Migratory locust. These locusts affect food security and livelihoods of more than 25 million people across CCA regions.

USAID/BHA/TPQ continues with its efforts and supports for applied/operational research in testing, improving, and expanding innovative technologies to help minimize the impacts of ETOPs on food security and livelihoods of vulnerable peoples and communities across low-

income countries and regions and promotes and encourages collaboration among countries and potential partners.

The online Pesticide Stock Management System (PSMS) that was developed by FAO with financial assistance from donors, including USAID Legacy OFDA, that continued benefiting participating countries across the globe was halted due to an IT issue - internet security and server switch. FAO is working on reinstating the system. Thanks to the system, SGR frontline countries and others had been able to effectively manage their strategic [pesticide] stocks and avoid unnecessary accumulations of unusable stocks and empty containers.

Note: A sustainable Pesticide Stewardship (SPS) can contribute to strengthening pesticide delivery system (PDS) at the national and regional levels. A viable SPS can be effectively established by linking key stakeholders across political boundaries and geographic regions. A strong and viable PDS can effectively reduce pesticide related human health risks, minimize environmental pollution, reduce pest control costs, improve food security, and contribute to the national economy. **End note.**

BHA/TPQ promotes an IPM approach, consistent with the Agency policies and procedures, to help minimize health risks and environmental contamination associated with misuse and management of pesticides. An informed procurement and judiciously executed triangulations of surplus usable stocks between countries is worth considering.

Inventory of Strategic Pesticide Stocks for SGR Control

During August, aerial operations treated locusts on 11,985 ha in Somalia and 180 ha in Sudan. Lack of access to northeast Ethiopia (Afar and Amhara regions) prevented surveillance and control operations against hoppers and potentially immature adults, a situation that allows locusts to continue breeding and increase in number at a higher rate than anticipated. As a result of lack of access, plan to break the invasion cycle and end the more than two year-long outbreaks in Horn and East Africa is being affected (BHA/TPQ, FAO, PPD/Ethiopia).

Table 1. Estimated inventory of strategic SGR Pesticide Stocks in frontline and invasion countries.

Country	Quantity, l/kg*
Algeria	1,186,034~
Chad	65,270
Egypt	10,253 ULV, 45,796~
Eritrea	14,150~
Ethiopia	110,543~
Libya	24,930~
Kenya	
Madagascar	206,000~ + 100,000 ^D
Mali	3,540~
Mauritania	39,803~
Morocco	3,412,374 ^D
~Niger	75,701~
Oman	5,000
Saudi Arabia	23,379~
Senegal	156,000~
Somalia	
Sudan	103,482~
South Sudan	
Tunisia	62,200 obsolete
Uganda	
Yemen	10,000; 180 kg GM

*Includes different pesticides and formulations - ULV, EC and dust.

~ data may not be current.

^D = Morocco donated 100,000 l of pesticides to Madagascar and 10,000 l to Mauritania in 2015 through triangulation

^D = In 2013 Morocco donated 200,000 l to Madagascar

^D = Saudi donated 10,000 to Yemen and pledged 20,000 l to Eritrea

^{DM} = Morocco donated 30,000 l of pesticides to Mauritania

GM = *GreenMuscle*TM (fungal-based biological pesticide, e.g., NOVACRID)

LIST OF ACRONYMS

- AAW *African armyworm (Spodoptera exempta)*
- AELGA *Assistance for Emergency Locust Grasshopper Abatement*
- AFCS *Armyworm Forecasting and Control Services, Tanzania*
- AfDB *African Development Bank*
- AGRA *Agricultural Green Revolution in Africa*
- AME *Anacridium melanorhodon (Tree Locust)*
- APLC *Australian Plague Locust Commission*
- APLC *Australian Plague Locust Commission Bands groups of hoppers marching pretty much in the same direction*
- ASARECA *Association for Strengthening Agricultural Research in Eastern and Central Africa*
- BHA *Bureau for Humanitarian Assistance*
- CABI *Center for Agriculture and Biosciences International*
- CAC *Central Asia and the Caucasus*
- CBAMFEW *Community-based armyworm monitoring, forecasting and early warning*

CERF	Central Emergency Response Fund	ICAPC	IGAD's Climate Prediction and Application Center
CIT	<i>Calliptamus italicus</i> (Italian Locust)	IGAD	Intergovernmental Authority on Development (Horn of Africa)
CLCPRO	Commission de Lutte Contre le Criquet Pèlerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region)	IRIN	Integrated Regional Information Networks
CNLA(A)	Centre National de Lutte Antiacridienne (National Locust Control Center)	IRLCO-CSA	International Red Locust Control Organization for Central and Southern Africa
COR	Central SGR Outbreak Region	ITCZ	Inter-Tropical Convergence Zone
CPD	Crop Protection Division	ITF	Inter-Tropical Convergence Front = ITCZ)
CRC	Commission for Controlling Desert Locust in the Central Region	FAO-DLIS	Food and Agriculture Organizations' Desert Locust Information Service
CTE	<i>Chortoicetes terminifera</i> (Australian plague locust)	Hoppers	young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)
DDLC	Department of Desert Locust Control	JTWC	Joint Typhoon Warning Center
DLCO-EA	Desert Locust Control Organization for Eastern Africa	Kg	Kilogram (~2.2 pound)
DLMCC	Desert Locust Monitoring and Control Center, Yemen	L	Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)
DMA	<i>Dociostaurus maroccanus</i> (Moroccan Locust)	LCC	Locust Control Center, Oman
DPPQS	Department of Plant Protection and Quarantine Services, India	LMC	<i>Locusta migratoriacapito</i> (Malagasy locust)
DPV	Département Protection des Végétaux (Department of Plant Protection)	LMI	<i>Locusta migratoria migratorioides</i> (African Migratory Locust)
ELO	EMPRES Liaison Officers -	LPA	<i>Locustana pardalina</i>
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases	MoAFSC	Ministry of Agriculture, Food Security and Cooperatives
EOR	Eastern SGR Outbreak Region	MoAI	Ministry of Agriculture and Irrigation
ETOP	Emergency Transboundary Outbreak Pest	MoARD	Ministry of Agriculture and Rural Development
Fledgling	immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed	NALC	National Agency for Locust Control
GM	GreenMuscle® (a fungal-based biopesticide); NOVACRID, Green Guard	NCDLC	National Center for the Desert Locust Control, Libya
ha	hectare (= 10,000 sq. meters, about 2.471 acres)	NOAA (US)	National Oceanic and Aeronautic Administration
		NPS	National Park Services
		NSD	Republic of North Sudan
		NSE	<i>Nomadacris septemfasciata</i> (Red Locust)
		OFDA	Office of U.S. Foreign Disaster Assistance
		PBB	Pine Bark Beetle (<i>Dendroctonus</i> sp. - true weevils)
		PHD	Plant Health Directorate

PHS Plant Health Services, MoA
Tanzania

PPD Plant Protection Department

PPM Pest and Pesticide Management

PPSD Plant Protection Services
Division/Department

PRRSN Pesticide Risk Reduction
through Stewardship Network

QSP *Quelea* species (Red Billed *Quelea*
bird)

SARCOF Southern Africa Region
Climate Outlook Forum

SCA *Schistocerca cancellata* (South
American Locust)

SFR *Spodoptera frugiperda* (SFR) (Fall
armyworm (FAW))

SGR *Schistoseca gregaria* (the Desert
Locust)

SPI *Schistocerca piceifrons piceiferons*
(Central American Locust)

SSD Republic of South Sudan

SPB Southern Pine Beetle
(*Dendroctonus frontalis*) – true
weevils

SWAC Southwest Asia DL Commission

PBB Pine Bark Beetle

PSPM Preparedness, Strategic Planning
and Mitigation (formerly known as
Technical Assistance Group - TAG)

TPQ Technical Program and Quality
Triangulation The process whereby
pesticides are donated by a
country, with large inventories, but
often no immediate need, to a
country with immediate need with
the help of a third party in the
negotiation and shipments, etc.
Usually, FAO plays the third-party
role in the case of locust and other
emergency pests.

UF University of Florida

USAID the United States Agency for
International Development

UN the United Nations

WOR Western SGR Outbreak Region

ZEL *Zonocerus elegans*, the elegant
grasshopper

ZVA *Zonocerus variegatus*, the
variegated grasshopper, is
emerging as a relatively new dry
season pest, largely due to the
destruction of its natural habitat
through deforestation, land
clearing, etc. for agricultural and
other development efforts and due
to climate anomalies

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To learn more about our activities and
programs, please, visit our website:
[https://www.usaid.gov/what-we-
do/working-crises-and-
conflict/responding-times-crisis/how-we-
do-it/humanitarian-sectors/agriculture-
and-food-security/pest-and-pesticide-
monitoring](https://www.usaid.gov/what-we-do/working-crises-and-conflict/responding-times-crisis/how-we-do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring)

**Additional resources on SGR and
other ETOPs**

SGR
USAID Pest Monitoring:
[https://www.usaid.gov/what-we-
do/working-crises-and-
conflict/responding-times-crisis/how-we-
do-it/humanitarian-sectors/agriculture-
and-food-security/pest-and-pesticide-
monitoring](https://www.usaid.gov/what-we-do/working-crises-and-conflict/responding-times-crisis/how-we-do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring)

Archived ETOP Bulletins:
[https://www.usaid.gov/what-we-
do/working-crises-and-
conflict/responding-times-crisis/how-we-](https://www.usaid.gov/what-we-do/working-crises-and-conflict/responding-times-crisis/how-we-)

[do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring/archive](https://www.fao.org/do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring/archive)

UN/FAO Desert Locust Watch
<http://www.fao.org/ag/locusts/en/info/info/index.html>

FAO Locust Hub
<https://locust-hub-hqfao.hub.arcgis.com/>
FAO Locust Emergency Appeal for Greater Horn of Africa and Yemen
http://www.fao.org/fileadmin/user_upload/emergencies/docs/Greater%20Horn%20of%20Africa%20and%20Yemen%20%20Desert%20locust%20crisis%20appeal%20%20May%202020.pdf

<http://www.fao.org/emergencies/crisis/desertlocust/en/>

FAO visuals on SGR
<http://tv.fao.org/>

FAO Desert Locust Crisis
<http://www.fao.org/emergencies/crisis/desertlocust/en/>

<http://www.fao.org/ag/locusts/en/info/info/index.html>

CIT, DMA and LMI – FAO-PPPD
<http://www.fao.org/locusts-cca/en/>

DLCO-EA
<http://www.dlco-ea.org/final/index.php/about-us>

FAO/Central Region Locust Control Commission
<http://desertlocust-crc.org/Pages/index.aspx?CMSId=8&lang=EN>

FAO/Western Region Locust Control Commission
<http://www.fao.org/clcpro/fr/>

FAO Locust Watch - Central Asia and Caucasus
<http://www.fao.org/locusts-cca/en/>

IGAD Climate Predication and Application Centres
<https://www.icpac.net/news/desert-locust-projection-october-2020/>

USAID supports for locust operations in the CAC Region:
<http://www.fao.org/locusts-cca/programme-and-donors/projects-donors/en/>

FAO SGR Response Overview Dashboard
<http://www.fao.org/locusts/response-overview-dashboard/en/>
FAO Locust Hub
<https://locust-hub-hqfao.hub.arcgis.com/>
<http://www.fao.org/ag/locusts/en/activ/DLIS/eL3suite/index.html>

FAW
USAID FtF FAW
<https://www.agrilinks.org/post/fall-armyworm-africa-guide-integrated-pest-management>
<http://www.cabi.org/isc/datasheet/29810>

<http://www.fao.org/emergencies/resources/maps/detail/en/c/1110178/>

USAID FAW PEA/PERSUAP
<https://ecd.usaid.gov/repository/pdf/50065.pdf>

FAO FAW Monitoring and Early warning System
<http://www.fao.org/3/CA1089EN/ca1089en.pdf>

FAO-USAID Global Action for FAW Control webinars <http://www.fao.org/fall-armyworm/education/webinars/en/>

FAO NURU FAW Application

<http://www.fao.org/news/story/en/item/1141889/icode/>

<https://acbio.org.za/sites/default/files/documents/BT%20Maize%20Fall%20Army%20Worm%20report.pdf>

<https://www.invasive-species.org/wp-content/uploads/sites/2/2019/03/Fall-Armyworm-Evidence-Note-September-2017.pdf>

FAW management animation SAWBO

<https://sawbo-animations.org/video.php?video=//www.youtube.com/embed/5rxlpXEK5g8>

AAW

<http://www.armyworm.org/latest-armyworm-forecast-irlco-csa-oct-2018/>

FEWS NET

<https://fews.net/>

NOAA CPC

<https://www.cpc.ncep.noaa.gov/products/international/itf/itcz.shtml>